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MAY

May 3, 1991

Mr Martin Hestmark
U S Environmental Protection Agency
Region VIII
999 18th Street, Suite 500, 8WM-C
Denver, CO 80202-2405

RE REVIEW AND COMMENT, BACKGROUND GEOCHEMICAL CHARACTERIZATION REPORT, ROCKY FLATS PLANT FOR 1989, 21 DECEMBER, 1990

Dear Mr Hestmark

The Colorado Department of Health, Hazardous Materials and Waste Management Division ("the Division") has reviewed the subject document submitted by DOE and prime contractor, EG&G The Division's comments are attached

The Division questions the selection process for background sites The report provides statistical methods for evaluating concentrations of contaminates, deemed to be background, while merely assuming that sites west of the plant qualify The lack of statistical or scientific approaches to background site selection is apparent and should be addressed

The source of the data subjected to statistical analysis must also be documented Correlation data or drawings must be provided to ensure that samples are from the same population, i e correlation sections of ground water units A "Background Characterization Field Program Report", to have been submitted along with the referenced document, has not been received The report may address our documentation concerns and should be submitted with the 1990 Background Report (RFP committed to this document in response to Section 3 1, Comment 5 of the Division's review of the Background Geochemical Characterization Report, December 1989)

For these and other reasons set forth in the body of comments, the Division believes that the conceptual approach of the study is flawed Statistical treatment will not suffice while site selection and population groupings remain unsupported

Furthermore, the 1990 Background Report, when prepared, should be structured for consumption by the general public The current style and content is beyond the grasp of all but the most skilled statisticians

If you have any questions concerning these comments, please call Harlen Ainscough of my staff at (303) 331-4977

Sincerely,

Gary W. Baughman

Gary W Baughman, Unit Leader
Hazardous Waste Facilities
Hazardous Materials & Waste Management Division

cc Dan Miller, AGO
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Brent Lewis, DOE
Tom Greengard, EG&G
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Colorado Department of Health
Comments on the Background Geochemical Characterization Report,
Rocky Flats Plant for 1989 Dated 21, December, 1990

General Observations and Comments

How "background" locations were determined to be "undisturbed" by plant operations, particularity those used for soil and surface water characterization, is of concern The entire report relies heavily on statistics yet such procedures, or any scientific methodology, are lacking in the selection of background sites The swirling and diurnal winds of RFP minimize the potential for undisturbed areas around the plant site As a result, sites further removed from RFP need to be characterized (The sites and methodologies of the separate off-site investigation, briefly mentioned in the document, should be submitted for determination of relevancy and adequacy )

Specific Comments

Executive Summary, Page 1-2, paragraph 2, Describe in lay terms, to the extent practical, the meaning and techniques of "tolerance intervals" Since background is expected to be an important consideration in the level of cleanup, the public must be reasonably assured that the technical methods are reliable and properly applied

Clarify the statement concerning 50% detectable concentrations Possible rephasing, Tolerance intervals were computed for chemicals where greater than 50% of the samples showed concentrations at or above the detection limit As currently stated, one might believe that only 50% or less of a given chemical is detectable thereby causing concern about the level of contamination being reported

Executive Summary, page 1-2, paragraph 3, Describe how "different lithologic units" were determined, i e how were correlative and non-correlative units differentiated? Provide the correlation procedures used, i e borehole description plots, GP logs, cross and structure sectioning, etc

Section 2 1, page 2-1, paragraph 1, The assumption that any nearby areas, especially soil and surfaces waters, are undisturbed by plant operations indicates that the conceptual framework for this report is seriously flawed The operator must support the sampling (sites) thru scientific investigation or establish acceptable stations off-site

Section 2 4 1, page 2-4, paragraph 1, Explain for public consumption, the differences in ANOVA or MANOVA and the reasons why, and under what circumstances, each are used

Section 2 4 1, page 2-6, paragraph 2, This paragraph is a prime example of too much jargon beyond the grasp and acceptance of the public

Section 2 4 1, page 2-6 paragraph 4, Further discuss/explain the probability plots and the Shapiro-Wilks test and their interpretation Use example plots

Section 2 4 1, page 2-7, paragraph 2, Explain the Kolwogorov-Smirnov test and chi-squared test

Section 2 4 1 page 2-8, paragraph 2, Explain and provide rationale on how unlike data can be combined

Section 2 4 3, page 2-12, paragraph 3, Is it RFP's intent to "uncorrect" the 1989 RAD data in order to conform to the current EG&G guidelines for RAD analyses? If not, won't the inclusion of negative numbers distort the background data?

Section 2 4 3, page 2-13, paragraph 1, What steps have been or will be taken to eliminate "large counting errors"? In this regard, the extractive and determinative technologies should be described in an appropriate section

Section 2 4 5, page 2-13, Since it is true that background data may exceed the upper tolerance limit 5% of the time, how does the operator otherwise plan to establish a threshold as evidence of contamination? In other words, at what point will the operator acknowledge the need for cleanup?

Section 2 4 5, page 2-15 paragraph 1, A comprehensive summary of ground water evolution is not only within the scope of background characterization, it appears to be critical. If the operator is unable to demonstrate that these changes represent background, then cleanup to a more stringent level may be justified

Section 2 4 4, page 2-15, paragrapn 2, Are background data insufficient due to non-detectability or due to lack of sufficient sampling? If the latter, what steps have been, or are being, taken to correct the problem?

Section 3, page 3 1, paragraph 1, The selection of sample sites outside and upgradient of "known" contaminated areas implies that they could be located in "unknown" contaminated areas This is especially true for soil and surface water sites subject to wind dispersed contamination The use of aerial photographs, and other remote sensing techniques does not prelude the potential for subtle contamination Again, the entire conceptual approach of this study is suspect

Section 3, page 3-1, paragraph 2, Explain how the TAL and other parameters being determined relate to the hazardous materials used on site Are any contaminants, including residuals or by-products, being missed

Section 3 1, page 3-1, Please include a map, and cross-sections to scale of the "mappable sandstones" so that the Division may gain a clearer understanding of their character

Section 3 1 4, page 3-6, paragraph 3, Plate 1 shows types of wells and Surface Water (SW) stations What is needed is a Bedrock Ground Water Map(s) properly coded to show those completed in similar or correlative units, i e those in weathered SS vs unweathered SS etc This would enhance data presentation

Section 3 1 4, page 3-7, paragraph 2, Identify the listed wells on Plate 1 using the approach suggested in the preceeding comment

Section 3 2, page 3-7, paragraph 3, EPA's comments on the 1989 draft report, and the operator's responses, regarding possible contamination of SW 80 and SW 104 should be discussed This discussion should address the Division's concerns that these sites may have been affected by wind dispersed contamination from the plant This will remain an issue until such time as the operator satisfactorily demonstrates through scientific and/or statistical methodologies that these sites qualify as "undisturbed" or background The lack of identifiable SWMUs (IHSS) is insufficient proof that the area is undisturbed

Section 3 3, page 3-8, paragraph 1, Non-anticipation of plant impacts is judgmental and is not supported by facts The potential exists for wind dispersed contaminants to be within these samples

Section 3 4, page 3-8, The statistics presented in this study represent a "black box" approach to characterization as signified by this section Mere tabulation of data supporting the selection of zones as alluvial, unweathered SS, weathered claystone etc , re Table 3 1 and 3-5 are, in themselves, inadequate Borehole plots showing screened or sample zones are needed to allow Division verification of correlative units To the extent practical, cross-sections and maps should be prepared to demonstrate correlation and, thereby, validate the appropriateness of the statistical samples

Relevent to this comment, RFP agreed to provide a "background characterization field program report" (See RFP response to Section 3 1, Comment 5 in the 1989 Background Geochemical Characterization Report) The report was to contain "well construction and geologic logs for each well installed in 1989", including specific fence diagrams and geologic cross sections The document was not submitted, as promised, along the with subject document but is necessary to demonstrate that the statistical treatments are proper and complete

Plate 2 is the Surficial Geology not Plate 3 as shown in the text

Section 3 4, page 3-9, paragraph 5, The listed soil and colluvial sampling sites shall be depicted, or differentiated from alluvial "wells", on a map Plate 1 does not provide sufficient differentiation

Section 3 4, page 3-11, The scope of the separate off-site investigations of plutonium should be summarized and the interrelationship to this report and background levels should be discussed

Section 3 4, page 3-18, Table 3-5, Borehole B405189 is not indicated in Table 3-1 to be a background borehole sample, however, lithologic descriptions are presented in Table 3-5 Which is correct?

Table 3-5 data needs to be reorganized so that data from a given hole are listed sequentially from collar to TD For example, pages 3-20 and 3-21 show additional data for holes initially listed on pages 3-18, 3-19 and 3-20

Is table 3-5 complete, the first page, page 3-18, indicates it is "continued"?

Section 4 2, page 4-3, paragraph 3, The contents of this paragraph suggests that flaws exist in sampling or analytical procedures How then, can credence be given to statistical treatment/interpretation?

Section 4 4, page 4-6, paragraph 4, Once again, background sampling stations and wells are "assumed" to be unimpacted by plant operations

Section 5 2 1, page 5-3, paragraph 1, In this paragraph it is reported, in essence, that with some exceptions differences exist vertically or stratigraphically relative to lithology Also, with the exception of Chlorine ground water does not statistically differ from North to South Referring back to Section 2 4 5 (page 2-15, paragraph 1) and the statistical approach (Section 2 4 1 page 2-4, paragraph 1 & 2) does this not suggest that the potential for ground water evolution is diminished? Is the Division correct in concluding that data within the North and South subsets were statistically compared before comparing North vs South If so, would this not address, at least in part, the evolution issue? If not, what additional sampling stations could be added to test for ground water evolution?

Section 5 2 1, page 5-3, paragraph 2, In lay terms, what is the practical value of knowing that the proportion of non-detects exhibit "no statistically significant difference(s)" Please be specific

Section 5 2 2, page 5-4, paragraph 1, It is stated that unweathered SS ground water has a different hydrochemical facies than the other subgroups Please describe the differences, i e what kind of water is it For example, the text states that Rocky Flats Alluvium "plots in the calcium bicarbonate" field where does the SS plot?

It would clarify an unintended disparity by explaining that the lithologic groups can be, and are, different with respect to analytes but, excepting unweathered SS, are similar with respect to major ions Compare this paragraph to the last paragraph of Section 5 2 1

Section 5 3 1, page 5-18, paragraph 2, It is stated that sampling techniques may have resulted in the highs reported Again this ignores the possibility that wind dispersed contaminates have "disturbed" the sites

Even though SW 80 and SW 104 may be comparable to the bottom sediments etc (re DOE response to EPA's 1989 comments on the draft report) there is no assurance that bottom sediments are undisturbed by plant operations and nothing has been done to prove that the sites are background

Section 5 3 3, page 5-23, paragraph 3, The statement "radionuclide concentrations in SW-080 and SW 104 are nearly indistinguishable from other background sediment sites" is misleading Examination of the raw data, Appendix A, shows that concentrations at other sites are higher or lower for gross Alpha and Beta etc The statement leads the reader to assume that all concentrations are low or insignificant The data may, in fact, indicate contamination of the sediment sites The inclusion of sediment into the surface water samples from SW-80 and SW-104 is a problem in comparing surface water data, however, that is not the prime issue The prime issue, given the fact that some sediments show concentrations higher than SW-80 and SW-104, is whether the origins are natural or man-made Until ARAR standards are fully established the issues remain real rather than inconsequential

Section 5 4 1, page 5-30, paragraph 1 The significance of the proportion of non-detects is not clear, please clarify

Section 5 5 1, page 5-32, paragraph 2, See previous comment

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